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| SAR CHESHMEH CONCENTRATOR EXPANSION PROJECT PHASE 1 | EQUIPMENT DATA SHEETS FOR 22' x 32.5' F/F BALL MILL | SAR CHESHMEH COPPER MINING COMPANY |
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Model/Size: 22' x 32.5' F/F (32' EGL) Ball Mill 6705mm x 9906mm (9754mm EGL)

Type of mill: Ball Mill, Wet Grinding

Media Type/Size: Grinding Balls / 3" Maximum (76 mm) Rockwell "C" hardness 61-65

Ball Volume and Estimated Weight: 45% of mill volume = 5570 ft³ (158 m³), 1,615,300 lbs (732,700 kg)

Maximum Volumetric Load: 45%

Feed and product material physical characteristic: Feed top size 5 mm, discharge top size - .3 mm

Working hours per year: 7440 hours

Efficiency: 90% - 97% gear efficiency

Mill Type Discharge: Overflow Discharge

Mill Diameter, (Inside Shell): 22' (6705 mm)

Nominal Mill Length: 32.5' F/F (9906 mm) Effective Grinding Length: 32' EGL (9754 mm)

Mill Speed: 12.84 RPM at 78 % Critical Speed, Mill Rotation: Single rotation ref .GA dwg. E1-30-MD-1 (85-340D01339)

Designed for Metal Liners: Yes (liner bolt holes will accept liner bolts for metal liners if desired)

Feed Apparatus: Type: Feed spout assembly with support stand

Lining Material: 1.0" (25 mm) Rubber Duro 60

Weight: 1600 lbs (726kg) (estimated)

Shell: Thickness: 3.00" (76 mm) Material: ASTM A-36 / Equivalent

Number of Sections: 3 x 360 degree flanged cans

Weight Total: 340,280 lbs (154,670 kg) (Estimated)

Weight of Largest Section: 114,260 lbs (51,940 kg) (Estimated)

Number of Ball Ports: Two (2)

Bolt Sizes: M64 shell / head and shell / shell

Heads: Weight: 97,600 lbs / Head (44,360 kg) (Estimated)

Material: DIN GGG50 Ductile Iron

Number of Pieces: 2 x 180 Degree segments / head

Weight of Largest Piece: 48,800 lbs (22,180 kg) (Estimated)

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Trunnions: Weight: 65,000 lbs (29,545 kg) / trunnion (Estimated)

Material: DIN GGG50 Ductile Iron

Number of Pieces: One (1) Feed Trunnion, One (1) Discharge Trunnion

Trunnion Bearings: Type: Hydrostatic Sleeve - self alignment type Material: High lead bronze SAE 67

Feed End Size: 115" x 26" (2921mm x 660mm) Discharge End Size: 115" x 26" (2921mm x 660mm)

Weight: 28,500 lbs (12,955 kg) each bearing

Lubrication Method: External high pressure lift

Jacking Oil Method: N/A

Lubrication Pumps: Included; Quantity: L.P. (2) / H.P. (3) Motor: L.P. (2 x 10 HP) / H.P. (3 x 50 HP)
Pinion Bearings (2 x 1.5 HP)

Bearing Temperature Sensors: Yes, 100 OHM Platinum RTD

Max. allowable bearing temperature: 8° C above normal operating (75° C absolute max.)

Oil Pressure Sensors: Yes, on Trunnion Bearing oil supply line

Ring Gear: Type of Gear: Single Helical Service Factor: Durability / Strength: 1.5 / 2.5 min

Helical Angle: 7 degrees Number of gear sections: two 180° segments

Face Width: 32 inches ((813mm))

Material: Cast alloy steel DIN G 35CrNiMo6.6

Hardness: 295 BHN AGMA Q #: 10

Number of Teeth: 316

Lubrication Method: Automatic air operated spray

Pinion: Pinion rev/min: 176.47 RPM Number of Teeth: 23

Pinion Bearing Make: SKF B10 Rating: 100,000 Hours

Pinion Bearing Size: 23276 Lubrication: Oil lubricated, integral lube system

Pinion Shaft - Material: Forged alloy steel DIN G30NiCrMo 8 Diameter: 28.77 O.D. (731 mm)

Hardness: 365 BHN AGMA Q #: 12

Bearing Temperature Sensor: Yes Pinion Reversible: Yes

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Motor: Motor Type: Two (2) Fixed Speed Quadramatic Synchronous Motors with Brushless Exciters
Motor Speed: 176.47 RPM HP: 2 x 5 500 HP (2 x 4101 KW)

Reducer: Make/Size: N/A
Ratio: _____ Service Factor: _____

Clutch: Make: Eaton Airflex Size: 51VC1600 Dual Wide
Guard Included: Yes Type: Fabricated Steel
Air Required: 27.5 ft³/min at 100 psi (.78 m³/min at 7.0 bar) / clutch engagement x 2 clutches

Feed Trunnions Liner: Liner: Conical Steel Fabrication
Material: ASTM A-36, - covered with Rubber Duro 60
Internal Liner Diameter: 48.0" (1220mm) To be confirmed
Internal Spiral: N/A

Discharge Trunnion Liner: Liner: Steel Fabrication
Material: ASTM A-36, - covered with Rubber Duro 60
Inside Liner Diameter: 87.50" (2,220 mm) To be confirmed
Integral Spiral: included

Trommel Screen: Material: Steel Fabrication with replaceable urethane panels
Hole Size: Slot .75" (19mm) x 2.0" (50mm)
Spiral: Included
Inside Diameter: 112.00" (2845 mm)

Feed End Liners: Material/Thickness: 4" (100mm) thick rubber liners with separate lifter bars - by end user
Weight - Total: 29.075 lbs (13,216 kg) both heads (estimate) Heaviest Piece: N/A
Bolt Size: 1.25" (32mm) Type: By end user
Lifter dimensions, Quantity: 10" x 8.5" (250mm x 225mm) / 24 rows per head

Discharge End Liners: Material/Thickness: 4" (100mm) thick rubber liners with separate lifter bars - by end user
Weight - Total: 9.075 lbs (13,216 kg) both heads (estimate) Heaviest Piece: N/A
Bolt Size: 1.25" (32mm) Type: By end user
Lifter dimensions, Quantity: 10" x 8.5" (250mm x 225mm) / 24 rows per head

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